

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application.

COMPLETE LISTING OF CLAIMS:

Claims 1-7 : (Canceled)

Claim 8 : (New) A coaxial microwave plasma torch, comprising:

a cylindrical outside conductor;

a cylindrical electric discharge tube fixedly inserted into an axial hole formed in said outside conductor on one end face side; and

a coaxial cable for microwave transmission, said coaxial cable having one end fitted to an other end face side of said outside conductor from outside, wherein

an antenna electrically connected to an inside conductor of said coaxial cable is provided at one end thereof,

a through-hole, extending in an axial direction from the other end face side of said outside conductor toward said axial hole, is formed in said outside conductor,

said antenna extends, in a state electrically insulated from said outside conductor, into said electric discharge tube through said through-hole,

an outside conductor of said coaxial cable is electrically connected to said outside conductor, and

a gas inlet pipeline for supplying gas into said electric discharge tube is provided in said outside conductor.

Claim 9 : (New) The coaxial microwave plasma torch according to claim 8, wherein

a cylindrical space is formed between a peripheral face of said axial hole of said outside conductor and an outer peripheral face of said electric discharge tube, and

said cylindrical space extends in a radial direction by a previously determined length in the inside of said outside conductor and in an axial direction from a bottom face of said axial hole by an arbitrary length.

Claim 10 : (New) A coaxial microwave plasma torch, comprising:
a torch body with a double-tube configuration having a cylindrical outside conductor; and

a cylindrical electric discharge tube arranged with a space kept in a radial direction inside said outside conductor, wherein

said outside conductor of said torch body has one end opening closed with a lid,

said electric discharge tube has one end fixed to said lid and an other end protrudingly extending from an other end opening of said outside conductor,

a coaxial cable for microwave transmission, said coaxial cable having one end fitted to said lid of said outside conductor of said torch body from outside,

an antenna electrically connected to an inside conductor of said coaxial cable is fitted to one end thereof,

said antenna extends, in a state electrically insulated from said lid, into said electric discharge tube of said torch body through a through-hole formed in said lid,

an outside conductor of said coaxial cable is electrically connected to said outside conductor, and

a gas inlet pipeline for supplying gas into said electric discharge tube of said torch body is provided in said torch body.

Claim 11 : (New) The coaxial microwave plasma torch according to claim 10, wherein

a cylindrical auxiliary conductor is engaged into a cylindrical space formed between said outside conductor and said electric discharge tube in said torch body from an other end opening side of said outside conductor, and

said auxiliary conductor slides along an axial direction of said electric discharge tube without causing leakage of a microwave into a space formed with the inner peripheral face of said outside conductor and a space formed with the outer peripheral face of said electric discharge tube, while being in electrical contact with said outside conductor of said torch body, so as to be capable of appropriately changing a phase of a microwave.

Claim 12 : (New) The coaxial microwave plasma torch according to claim 10, wherein said gas inlet pipeline extends from the outside of said torch body into a cylindrical space between said outside conductor and said electric discharge tube through both or either of said outside conductor and said lid, and then connected to said electric discharge tube, to open to a region in a vicinity of a top of said antenna in said electric discharge tube.

Claim 13 : (New) The coaxial microwave plasma torch according to claim 10, wherein

said lid of said torch body at least has an inserting section which is made of a cylindrical dielectric material and inserted into said outside conductor,

said electric discharge tube has one end fixed to said inserting section, and

said gas inlet pipeline includes:

a tube portion having an electrical insulating property and passing through said outside conductor of said torch body from the outside of said torch body;

a first tube portion connected to said tube portion and passing through said inserting section of said lid; and

a second tube portion connected to said first tube portion and extending inwardly in the inside of said antenna and then extending in the axial direction toward a top of said antenna in the inside thereof, to open to said top.

Claim 14 : (New) The coaxial microwave plasma torch according to claim 8, wherein said antenna is made of said inside conductor of said coaxial cable.

Claim 15 : (New) The coaxial microwave plasma torch according to claim 10, wherein said antenna is made of said inside conductor of said coaxial cable.